参考資料

COSEL

TEST DATA OF LHA100F-5

Regulated DC Power Supply
September 9, 2019

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COSEL CO.,LTD.

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CONTENTS

1.Input Current (by Load Current) ・・・・・・・・・・・・・・・・・・・・・・・・ 1
2.Efficiency (by Load Current) ・・・・・・・・・・・・・・・・・・・・・・・・ 2
3.Power Factor (by Load Current) ・・・・・・・・・・・・・・・・・・・・・・・ 3
4.Inrush Current ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 4
5.Leakage Current ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 5
6.Line Regulation ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 6
7.Load Regulation ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 7
8.Dynamic Load Response ・・・・・・・・・・・・・・・・・・・・・・・・・・・ 8
9.Ripple-Noise (by Load Current) ・・・・・・・・・・・・・・・・・・・・・・・ 9
10.Ambient Temperature Drift ・・・・・・・・・・・・・・・・・・・・・・・・・ 10
11.Rise and Fall Time ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 11
12.Hold-Up Time ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 12
13.Instantaneous Interruption Compensation ・・・・・・・・・・・・・・・・・・ 13
14.Minimum Input Voltage for Regulated Output Voltage ・・・・・・・・・・・・ 14
15.Overcurrent Protection ・・・・・・・・・・・・・・・・・・・・・・・・・・・ 15
16.Overvoltage Protection ・・・・・・・・・・・・・・・・・・・・・・・・・・・ 16
17.Figure of Testing Circuitry ・・・・・・・・・・・・・・・・・・・・・・・・・ 17
(Final Page 18)

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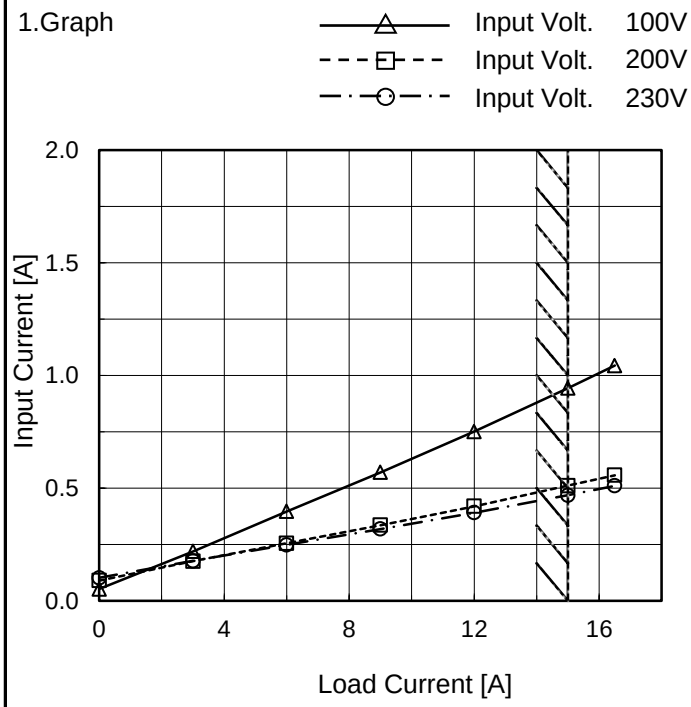
Model	LHA100F-5
Item	Input Current (by Load Current)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Note: Slanted line shows the range of the rated load current.

2.Values

Load Current [A]	Input Current [A]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.0	0.052	0.090	0.102
3.0	0.219	0.176	0.177
6.0	0.396	0.255	0.248
9.0	0.570	0.335	0.319
12.0	0.751	0.420	0.391
15.0	0.943	0.511	0.469
16.5	1.044	0.557	0.510
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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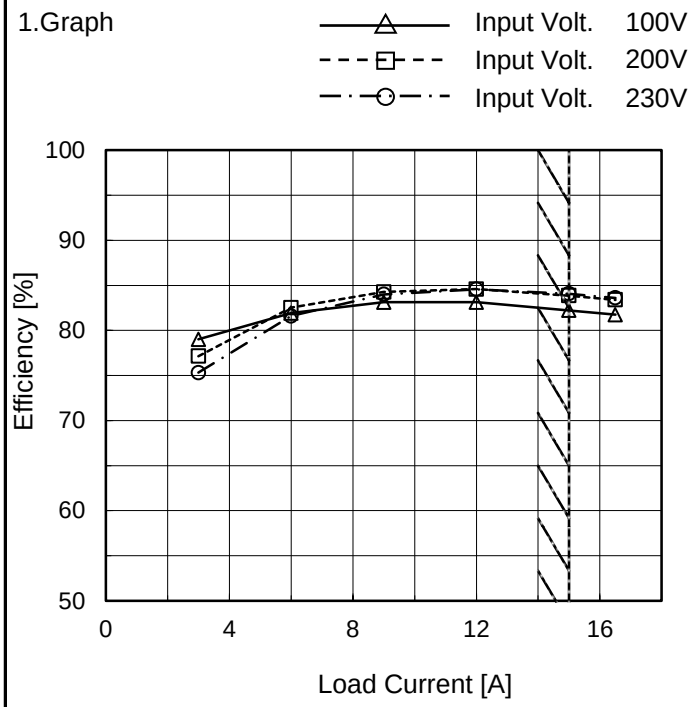
COSEL

Model	LHA100F-5
Item	Efficiency (by Load Current)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Note: Slanted line shows the range of the rated load current.

2.Values

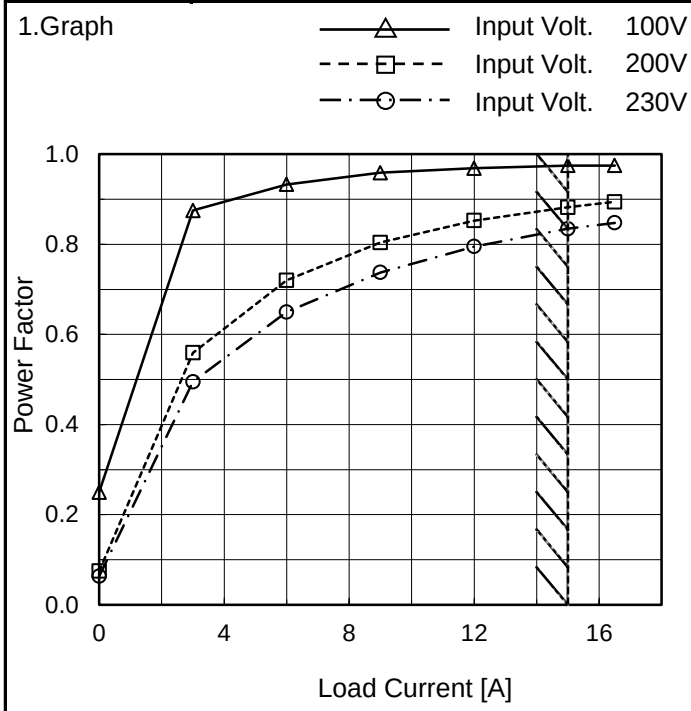
Load Current [A]	Efficiency [%]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.0	-	-	-
3.0	79.0	77.2	75.3
6.0	81.9	82.5	81.6
9.0	83.1	84.3	84.0
12.0	83.1	84.6	84.6
15.0	82.2	83.9	84.1
16.5	81.8	83.4	83.6
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	LHA100F-5
Item	Power Factor (by Load Current)
Object	————————

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Note: Slanted line shows the range of the rated load current.

2.Values

Load Current [A]	Power Factor Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.0	0.250	0.075	0.063
3.0	0.875	0.559	0.495
6.0	0.933	0.720	0.650
9.0	0.959	0.804	0.738
12.0	0.969	0.853	0.795
15.0	0.975	0.882	0.835
16.5	0.975	0.894	0.848
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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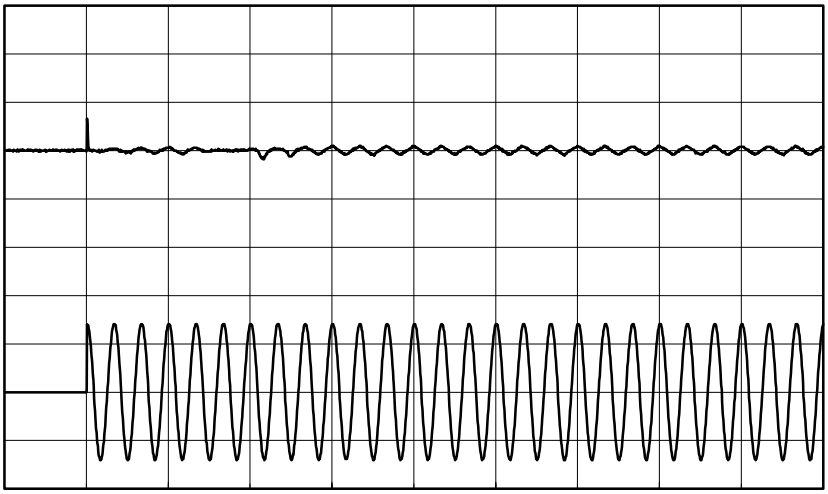
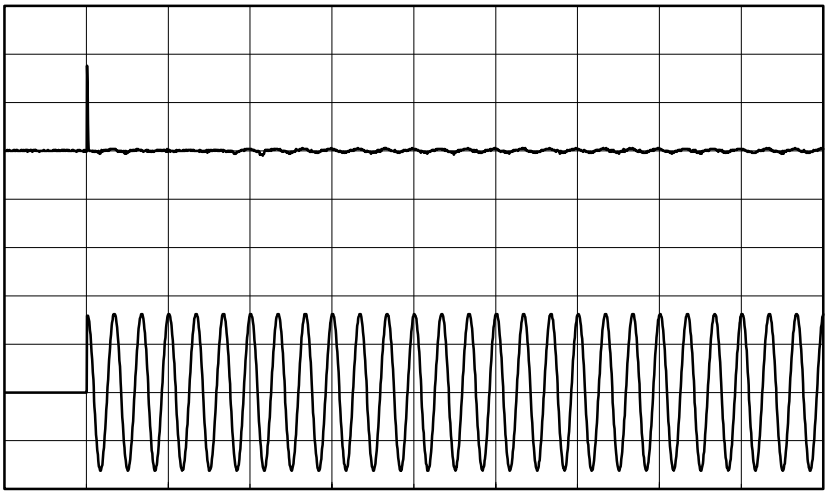
Model	LHA100F-5
Item	Inrush Current
Object	————————

Temperature 25°C
Testing Circuitry Figure A



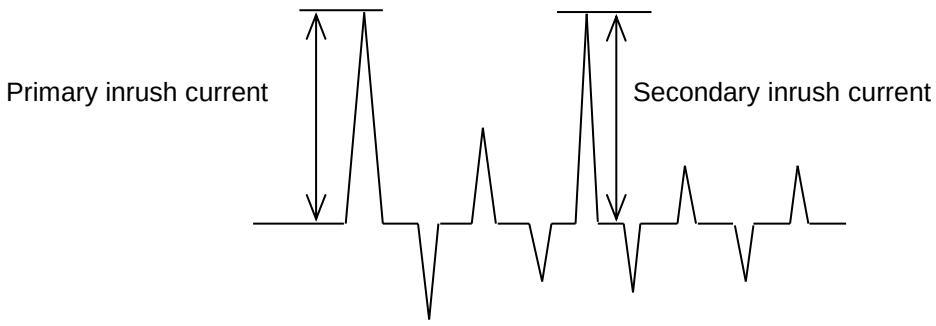
Input Voltage 100 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
13.2 A
Secondary inrush current :
3.6 A



Input Voltage 230 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
35.2 A
Secondary inrush current :
2.0 A



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Model	LHA100F-5	
Item	Leakage Current	Temperature 25°C Testing Circuitry Figure B
Object	――――――――――	

1.Results

[mA]

Standards	Testing Circuitry	Measuring Method	Input Volt.			Note
			100 [V]	230 [V]	240 [V]	
DEN-AN	Figure B-1	Both phases	0.16	0.33	0.34	Operation
		One of phases	0.25	0.65	0.67	Stand by
IEC62368-1	Figure B-2	Both phases	0.11	0.26	0.27	Operation
		One of phases	0.20	0.52	0.54	Stand by
	Figure B-3	Both phases	0.10	0.26	0.27	Operation
		One of phases	0.20	0.52	0.55	Stand by

The value for "One of phases" is the reference value only.

2.Condition

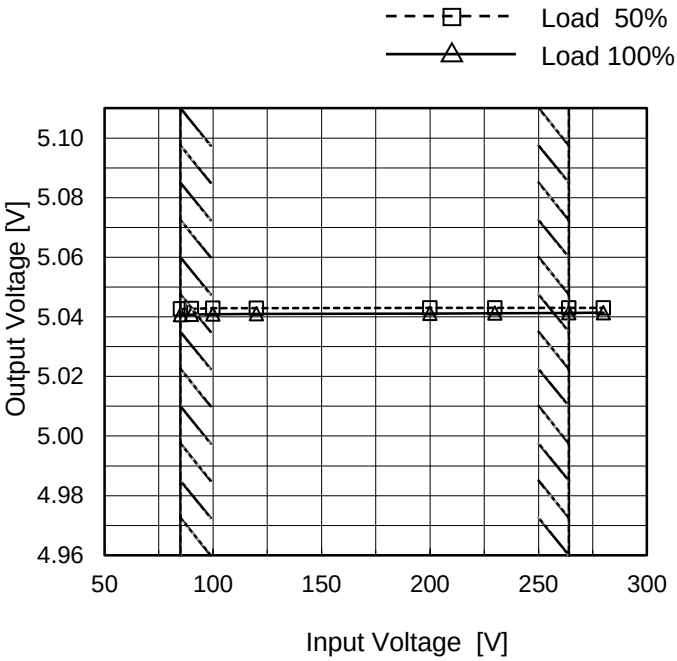
Leakage current value is concluded after measuring both phases of AC input and by choosing the larger one.

COSEL

Model	LHA100F-5
Item	Line Regulation
Object	+5V15A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Note: Slanted line shows the range of the rated input voltage.

2.Values

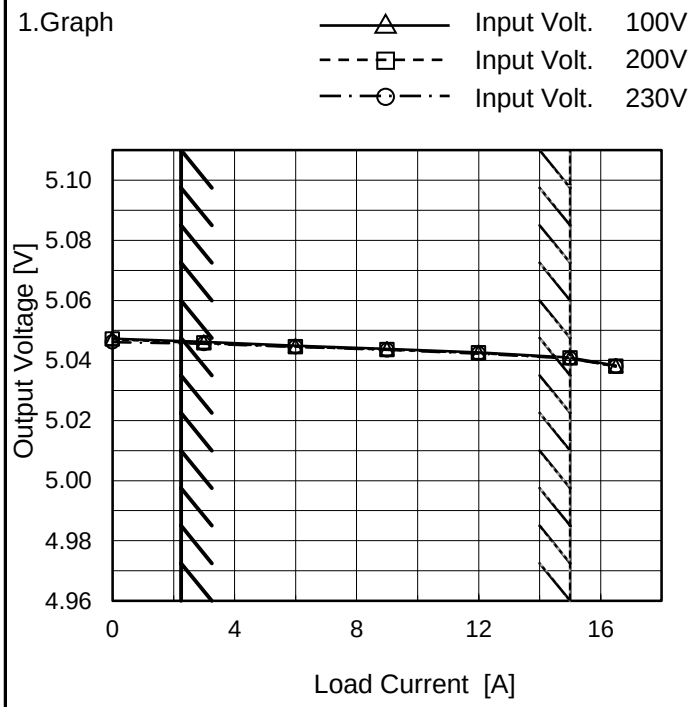
Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
85	5.043	-
90	5.043	5.041
100	5.043	5.041
120	5.043	5.041
200	5.043	5.041
230	5.043	5.041
264	5.043	5.041
280	5.043	5.041
--	-	-

COSEL

Model	LHA100F-5
Item	Load Regulation
Object	+5V15A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Note: Slanted line shows the range of the rated load current.

2.Values

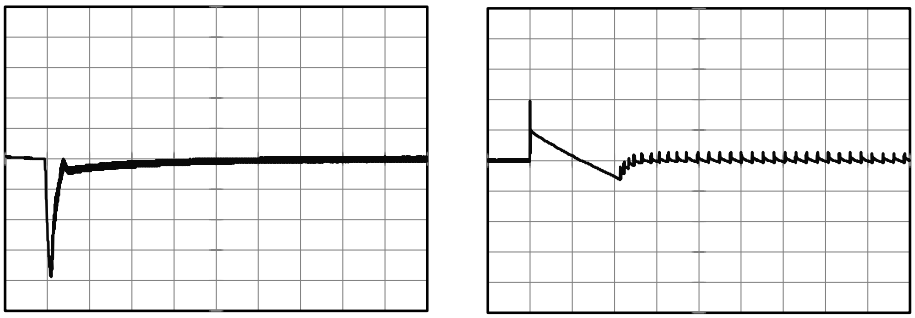
Load Current [A]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.0	5.047	5.047	5.046
3.0	5.046	5.046	5.046
6.0	5.045	5.045	5.045
9.0	5.044	5.044	5.044
12.0	5.043	5.043	5.042
15.0	5.041	5.041	5.041
16.5	5.038	5.038	5.038
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	LHA100F-5	
Item	Dynamic Load Response	Temperature 25°C Testing Circuitry Figure A
Object	+5V15A	

Input Volt. 230 V
Cycle 1000 ms

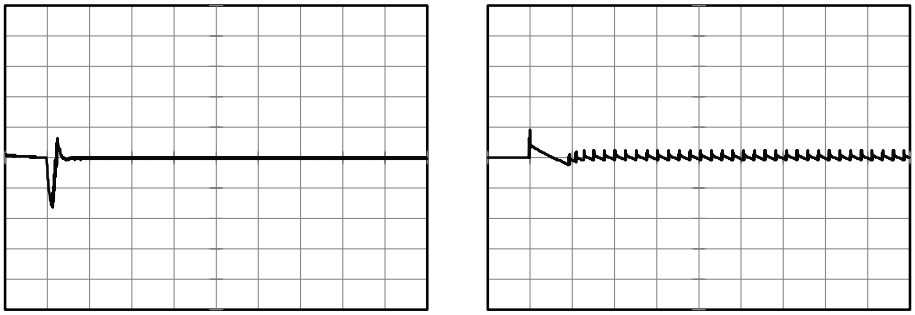
Min.Load (0A)←→
Load 100% (15A)



200 mV/div

1 ms/div 10 ms/div

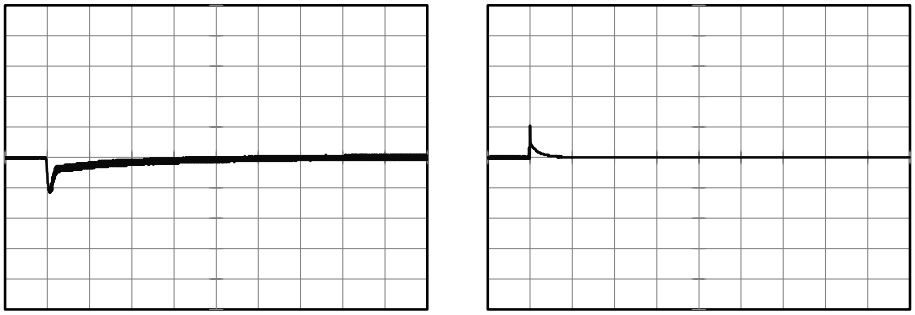
Min.Load (0A)←→
Load 50% (7.5A)



200 mV/div

1 ms/div 10 ms/div

Load 50% (7.5A)←→
Load 100% (15A)



200 mV/div

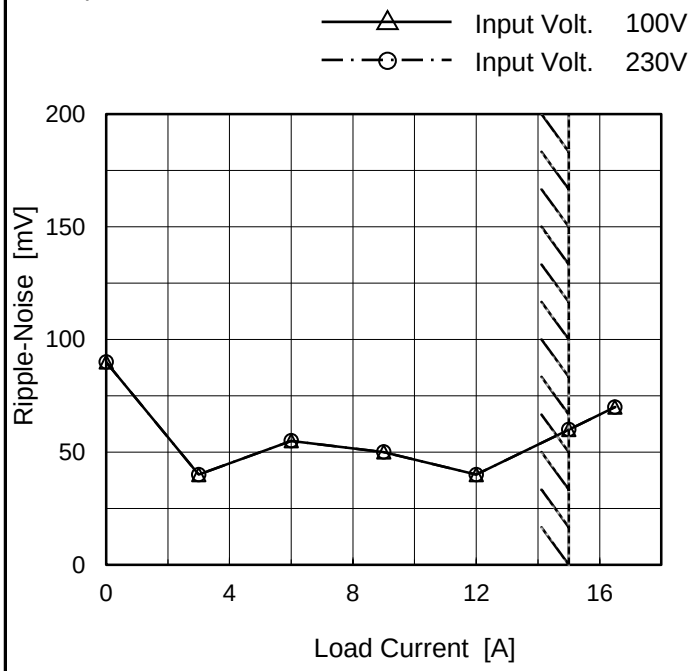
1 ms/div 10 ms/div

COSEL

Model	LHA100F-5
Item	Ripple-Noise（by Load Current）
Object	+5V15A

Temperature 25°C
Testing Circuitry Figure C

1.Graph



Measured by 20 MHz Oscilloscope.
Ripple-Noise is shown as p-p in the figure below.
Note: Slanted line shows the range of the rated load current.

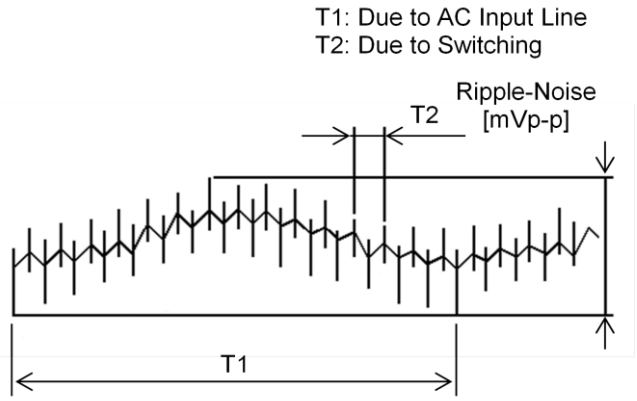


Fig. Complex Ripple Wave Form

2.Values

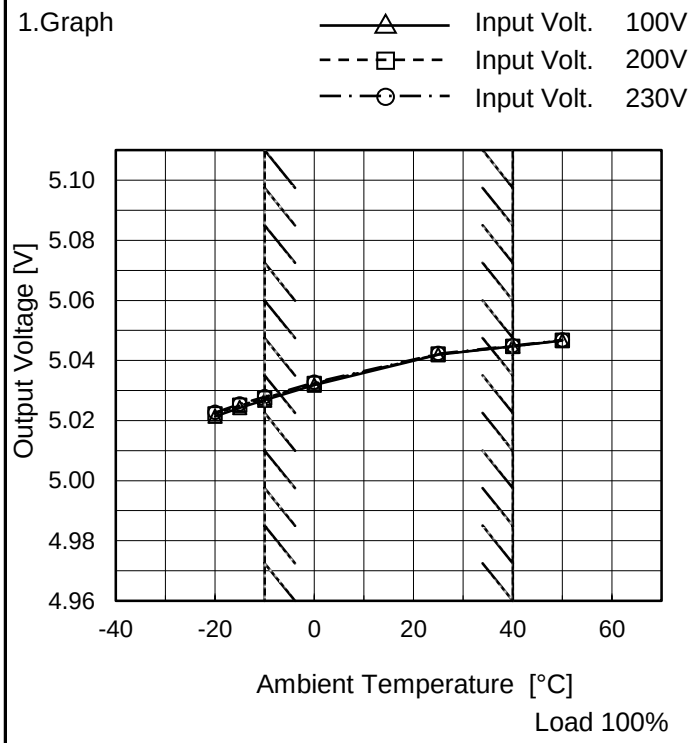
Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 100 [V]	Input Volt. 230 [V]
0.0	90	90
3.0	40	40
6.0	55	55
9.0	50	50
12.0	40	40
15.0	60	60
16.5	70	70
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	LHA100F-5
Item	Ambient Temperature Drift
Object	+5V15A

Testing Circuitry Figure A

1.Graph



Note: Slanted line shows the range of the rated ambient temperature.

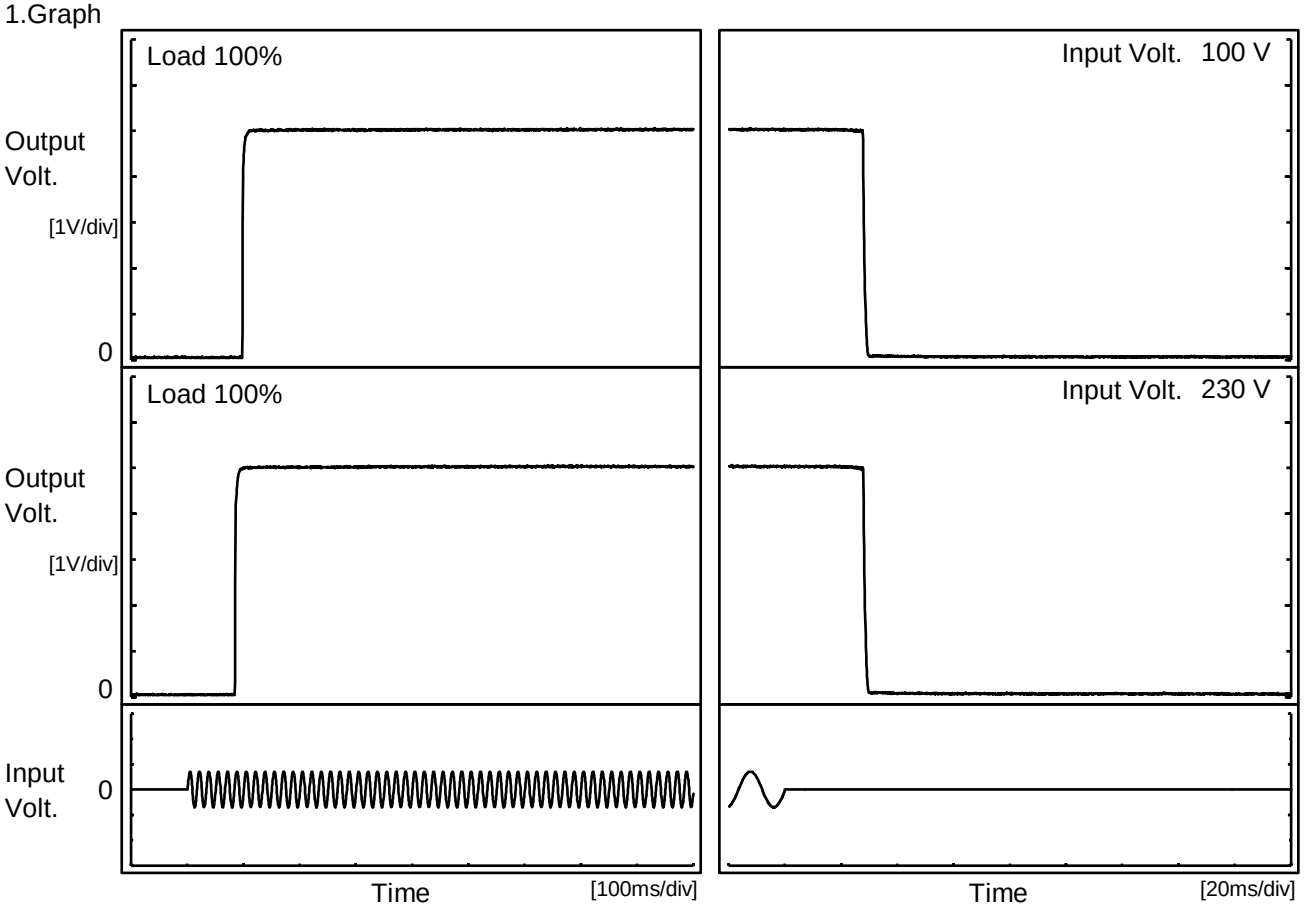
2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
-20	5.021	5.022	5.023
-15	5.024	5.025	5.026
-10	5.027	5.027	5.028
0	5.032	5.032	5.033
25	5.042	5.042	5.042
40	5.045	5.045	5.045
50	5.047	5.047	5.047
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

COSEL

Model	LHA100F-5	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	+5V15A	

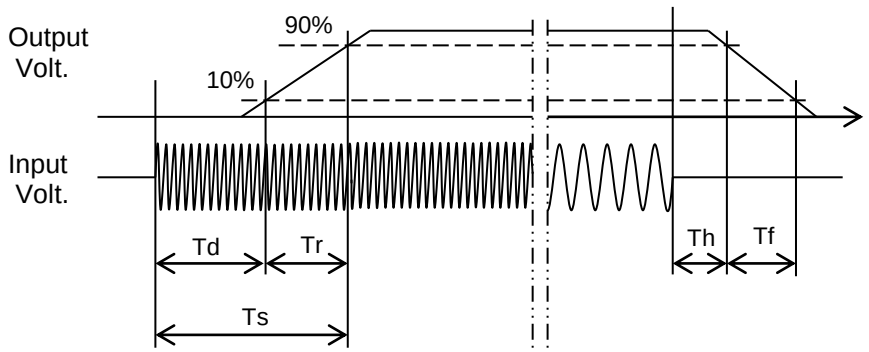
1.Graph



2.Values

[ms]

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
100 V	98.0	3.0	101.0	27.8	1.2
230 V	85.5	2.5	88.0	27.9	1.2

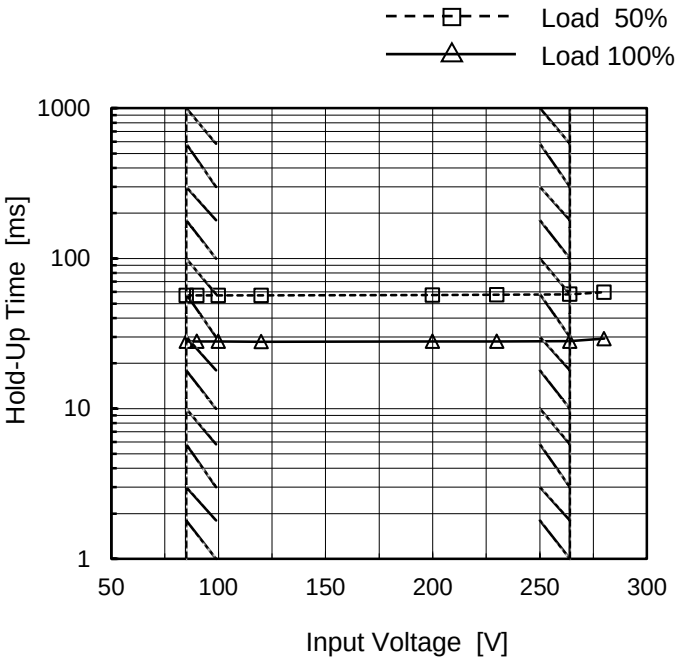


COSEL

Model	LHA100F-5
Item	Hold-Up Time
Object	+5V15A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy.
Note: Slanted line shows the range of the rated input voltage.

2.Values

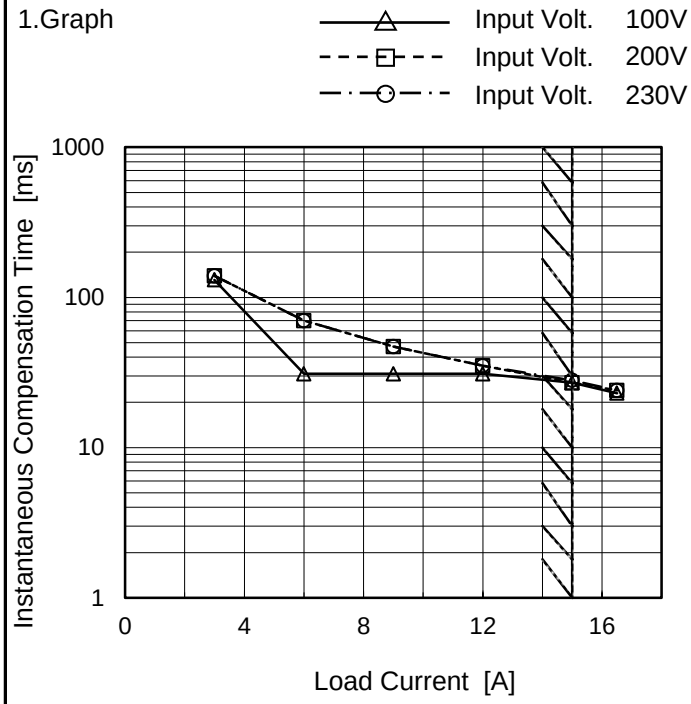
Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
85	57	-
90	57	28
100	57	28
120	57	28
200	57	28
230	57	28
264	58	28
280	60	29
--	-	-

COSEL

Model	LHA100F-5
Item	Instantaneous Interruption Compensation
Object	+5V15A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Note: Slanted line shows the range of the rated load current.

2.Values

Load Current [A]	Time [ms]		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.0	-	-	-
3.0	131	139	139
6.0	31	70	70
9.0	31	47	47
12.0	31	35	35
15.0	27	27	28
16.5	23	24	24
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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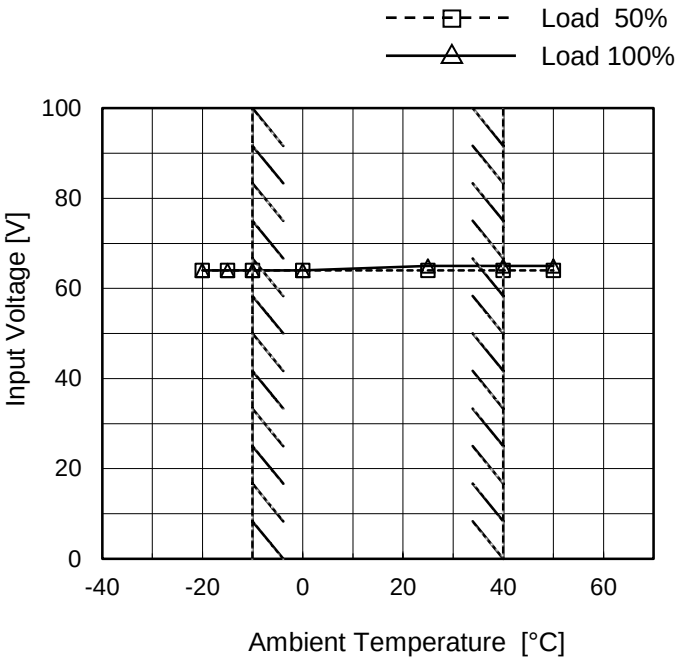
Model	LHA100F-5
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+5V15A

Testing Circuitry Figure A

1.Graph



Note: Slanted line shows the range of the rated ambient temperature.

2.Values

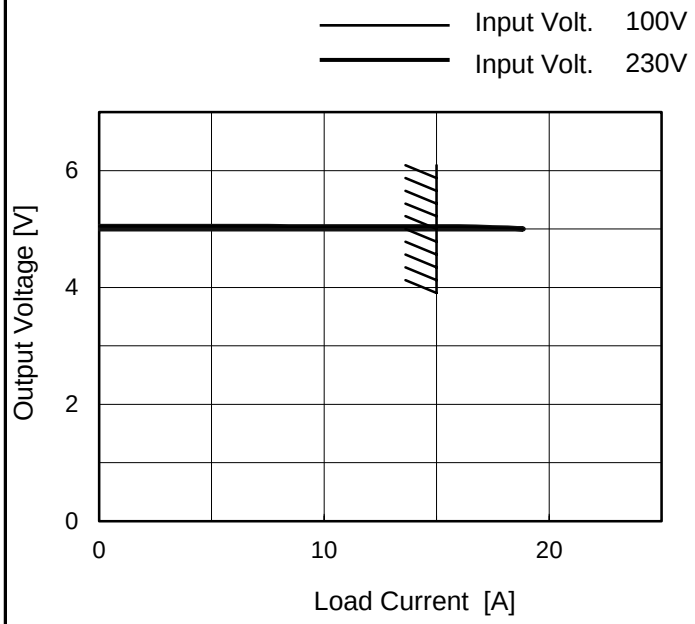
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	64	64
-15	64	64
-10	64	64
0	64	64
25	64	65
40	64	65
50	64	65
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	LHA100F-5
Item	Overcurrent Protection
Object	+5V15A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Note: Slanted line shows the range of the rated load current.

Overcurrent protection is Hiccup mode.

2.Values

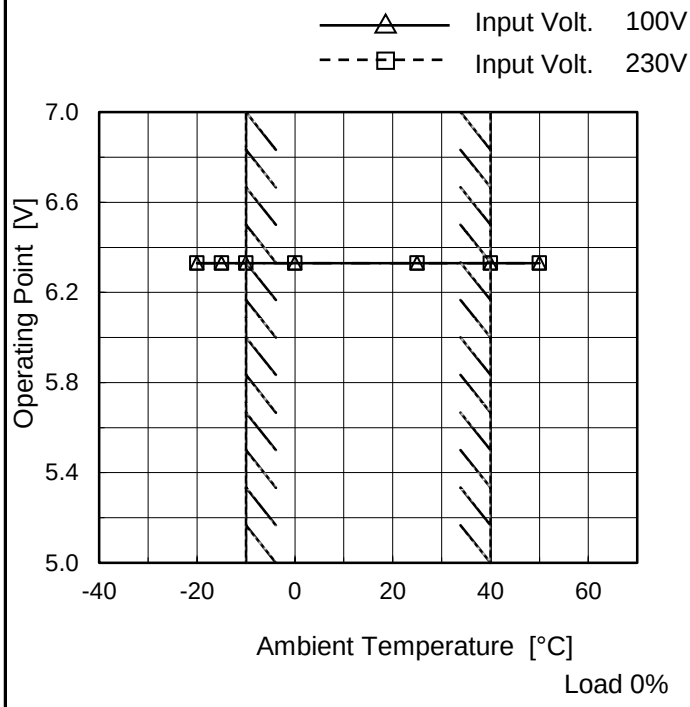
Output Voltage [V]	Load Current [A]	
	Input Volt. 100[V]	Input Volt. 230[V]
5.00	18.85	18.85
4.75	-	-
4.50	-	-
4.00	-	-
3.50	-	-
3.00	-	-
2.50	-	-
2.00	-	-
1.50	-	-
1.00	-	-
0.50	-	-
0.00	-	-

COSEL

Model	LHA100F-5
Item	Overvoltage Protection
Object	+5V15A

Testing Circuitry Figure A

1.Graph



Note: Slanted line shows the range of the rated ambient temperature.

2.Values

Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 100[V]	Input Volt. 230[V]
-20	6.33	6.33
-15	6.33	6.33
-10	6.33	6.33
0	6.33	6.33
25	6.33	6.33
40	6.33	6.33
50	6.33	6.33
--	-	-
--	-	-
--	-	-
--	-	-

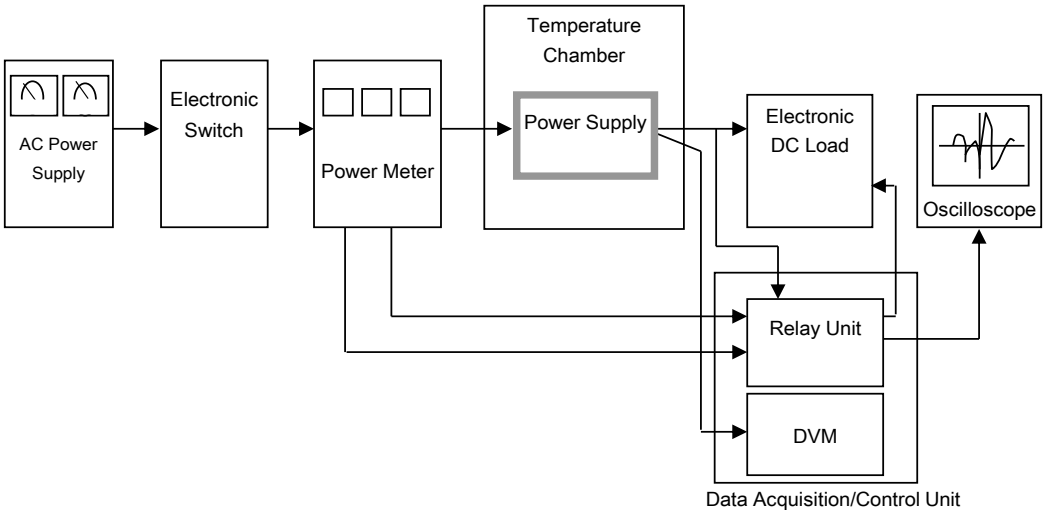


Figure A

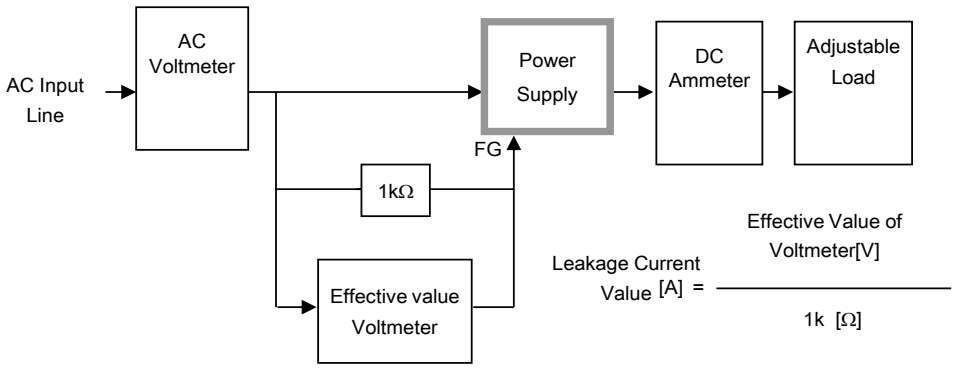


Figure B-1 (DEN-AN)

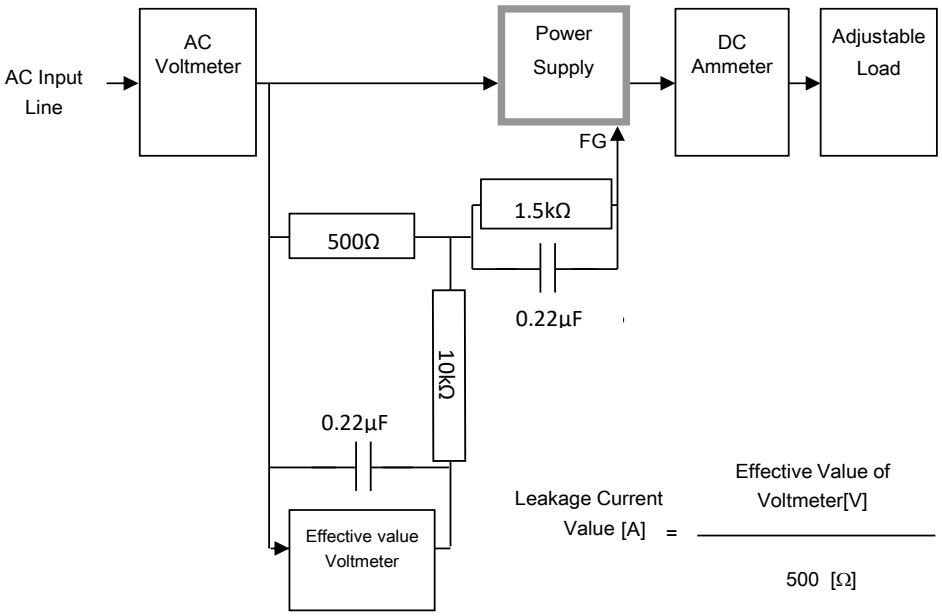


Figure B-2 (IEC62368-1 refer to IEC60990 Fig.4)

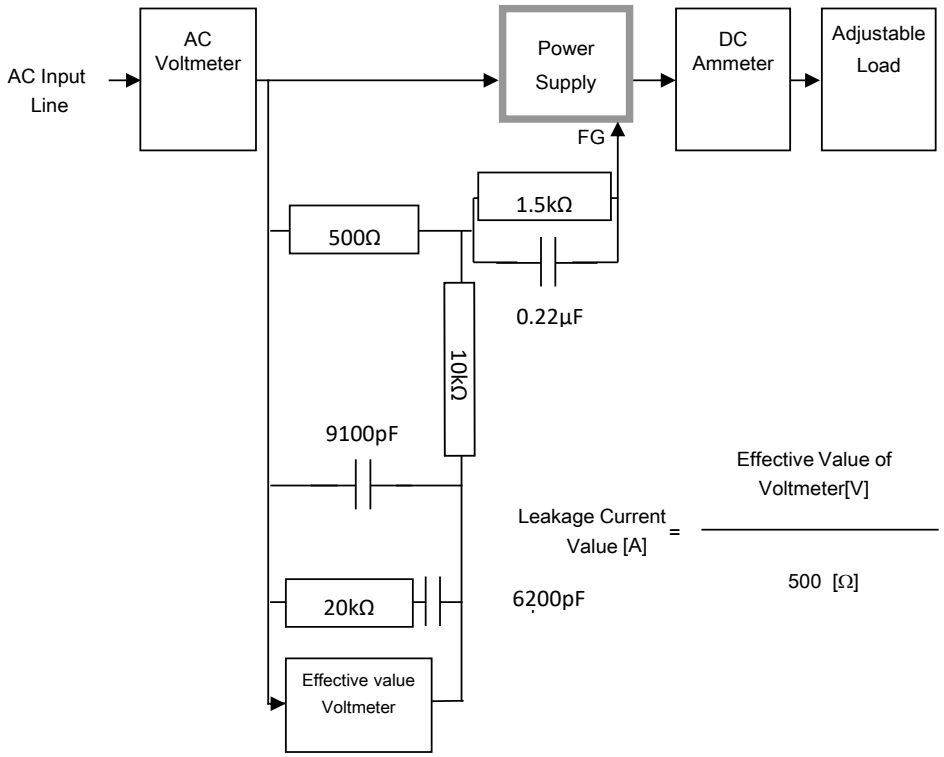
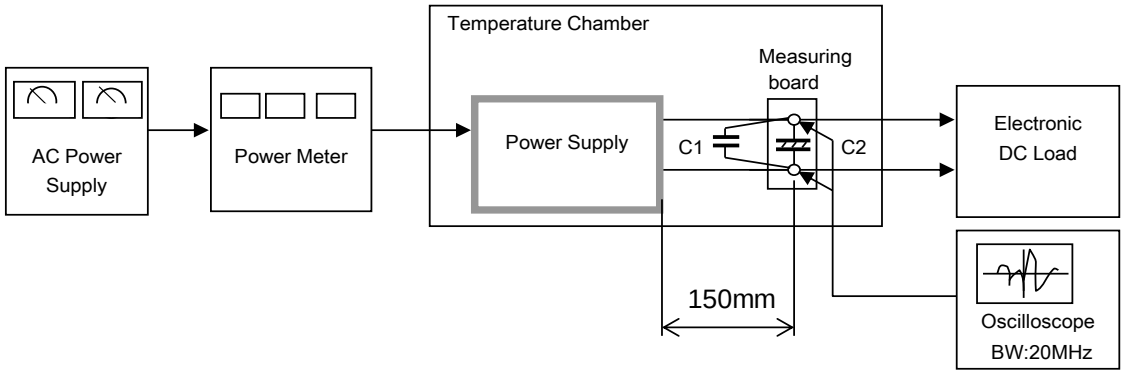


Figure B-3 (IEC62368-1 refer to IEC60990 Fig.5)



C1= 0.1 μF
(Film capacitor)
C2= 22 μF
(Electrolytic capacitor)

Figure C